



Vaccines

What do we know about the causes of autism spectrum disorder (ASD)?

Scientific studies show that many different genes work together with things in the environment to put a child at risk for autism spectrum disorder (ASD). Scientific studies do **not** show that vaccines cause ASD. Studies also have not found groups in the population that are at greater genetic risk from vaccines. Research studying environmental causes of ASD is important and will hopefully find causes for ASD.

Should I worry about vaccines?

Some parents of children with ASD may worry about connections between vaccines and ASD. For example, parents worry that vaccines may cause autism or may increase autism symptoms in children who already have ASD. However, scientific studies have not shown a connection between vaccines and ASD.

What do we know about vaccines?

Today's vaccines are the safest in history. Before they can be released, vaccines must pass many tests. The US Food and Drug Administration (FDA) tests a new vaccine in research studies with thousands of people before giving the vaccine a license. All vaccines are required to work safely and well before they are licensed. Once a vaccine is being used, the US FDA and the Centers for Disease Control and Prevention watch its use through the Vaccine Adverse Event Reporting System. They look for any problems that might turn up later.

Sometimes, vaccines can cause fever or soreness where the shot was given. Very rarely, children have an allergic reaction to a vaccine. Vaccines save lives and protect people against the spread of more diseases than ever before. If you decide not to give your child a vaccine, you may put your child and other children around him at risk. Your child could catch a disease that is dangerous or even deadly.

There are so many vaccines given to young children. Is it better to space them out?

Some families are worried about the number of vaccines that children receive. They worry that giving many vaccines early in life is bad for children. Some parents ask to hold off or space out vaccines because they are worried about giving "too many too soon."

Health care professionals and researchers know that vaccines are not too much for a child's immune system because the number of things that turn on the immune system, or antigens, in vaccines is less than what a child experiences in everyday life. Plus, the number of antigens in vaccines today is lower than ever because vaccines are much purer than they used to be. Giving many vaccines at once will not cause any risk to a child's development or health in general.

Vaccines have the least side effects when they are given at the right time and age, which can be done by following the schedule. If you do not vaccinate your child at the right time, your child will not be protected from the disease that the vaccine is trying to prevent. Your child might also put other children at risk if your child gets sick.

Does the measles, mumps, and rubella vaccine cause ASD?

Research has shown that many parents of children with ASD begin to have ASD worries when their children are between 18 months of age and 24 months of age. This is a few months after children get the measles, mumps, and rubella (MMR) vaccine. This makes parents wonder whether there is a connection, especially when a child loses some milestones such as social skills or eye contact. About 1 out of 4 children with ASD will begin to say words but then stop speaking later. In a 2004 report, the Institute of Medicine Immunization Safety Review Committee carefully reviewed all the published scientific articles and found that there is no link between ASD and the MMR vaccine. Researchers of more studies since that time have also not found any link. *The Lancet*, the medical journal that originally published the fraudulent article linking MMR vaccination and autism, publicly took back (withdrew) the article in 2011 because of serious concerns about the research, and the lead author had his medical license taken away because he committed fraud.



Does the measles, mumps, and rubella vaccine cause ASD? (continued)

Measles, mumps, and rubella are serious. Luckily, the vaccine has shown great success, with a drop in reported cases of all 3 diseases of more than 99% after the vaccine was licensed. You can protect your children by immunizing them against these serious childhood illnesses.

What is thimerosal? Is it safe?

Thimerosal is a vaccine preservative that contains a type of mercury, called *ethylmercury*. Thimerosal is used in some vaccines as well as other medications, including contact lens solutions and throat and nose sprays. Thimerosal helps prevent contamination with bacteria. Ethylmercury is a different type of mercury than methylmercury, which can be found in some fish and pollution. Methylmercury accumulates more rapidly in the human body than ethylmercury, and so it is more toxic. The low levels of ethylmercury in vaccines are broken down by the body differently and clear out of the blood more quickly than methylmercury.

Health care professionals agree that being around too much mercury can be harmful to children. The US government has decreased the ways children can be in contact with mercury, including switching to digital thermometers and making recommendations about how much of some fish you should eat. In 1999, the US Public Health Service and American Academy of Pediatrics (AAP) asked for thimerosal to be taken out of regular childhood vaccines so parents won't have to worry about it. Some states have passed laws to require this. We can't always get rid of all the mercury from around us, but we can control mercury used in vaccines. By taking thimerosal out of vaccines, we can lower the total amount of mercury a child may be in contact with during early life. As of now, all scheduled children's vaccines made in the United States have no thimerosal except for some flu vaccines.

Many flu vaccines do not have thimerosal, and parents can ask their child's doctor about flu vaccines without thimerosal. Some vaccines, such as MMR, polio, and chickenpox, have never contained thimerosal, and others, such as DTaP (diphtheria and tetanus toxoids and acellular pertussis), used to contain

thimerosal but now do not. Studies of large populations have not shown any relationship between ASD rates and getting vaccines with thimerosal or MMR vaccines in the past.

Should I vaccinate the siblings of my child with ASD?

Yes! Studies show that younger siblings of children with ASD are more likely to be behind on their vaccines or not vaccinated at all. It is important to remember that vaccinating your whole family is the best way to protect your children. Keep in mind that the diseases vaccines prevent can be very serious. Getting one of these diseases may mean having to stay in the hospital or go to many doctor's appointments, both of which are very stressful for children with ASD.

The AAP supports routine, on time vaccination of children to prevent dangerous childhood illnesses, and this includes children with ASD. Parents should share any concerns about vaccines with their child's pediatrician. Scientists will continue to study how to make vaccines safer and work better. They will also continue to study environmental events that might contribute to the causes of ASD.

Resources

American Academy of Pediatrics Childhood Immunization Support Program: www.aap.org/immunization

American Academy of Pediatrics HealthyChildren.org: www.HealthyChildren.org

Centers for Disease Control and Prevention "Vaccines & Immunizations": www.cdc.gov/vaccines

Children's Hospital of Philadelphia Vaccine Education Center: www.chop.edu/centers-programs/vaccine-education-center

Immunization Action Coalition. *Understanding Thimerosal, Mercury, and Vaccine Safety*. Atlanta, GA: Centers for Disease Control and Prevention; 2013. <https://www.cdc.gov/vaccines/hcp/patient-ed/conversations/downloads/vacsafe-thimerosal-color-office.pdf>. Accessed August 27, 2019

Vaccine Adverse Event Reporting System: <https://vaers.hhs.gov>

The information contained in this resource should not be used as a substitute for the medical care and advice of your pediatrician. There may be variations in treatment that your pediatrician may recommend based on individual facts and circumstances. Original resource included as part of *Caring for Children With Autism Spectrum Disorder: A Practical Resource Toolkit for Clinicians*, 3rd Edition.

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